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Characteristics of Landowners Converting Land in the Western Great Plains, 1975-77

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ABSTRACT

This study examines a comprehensive sample of farm and ranch landowners in seven Western Great Plains States. The sample is classified by land conversion activity between 1975 and 1977. More than 40,000 landowners (18 percent) in this area added cropland. The Northern Plains accounted for two-thirds of owners adding cropland. Operations adding cropland were of two types: new, expanding operations owned by younger, better educated, full-time farmers and established, speculative operations owned by older, less educated operators with a variety of nonfarm occupations. Soil erosion on land owned by those who converted land is little different than erosion on all land.

Keywords: Great Plains, cropland, cropland addition, landownership, erosion.

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INTRODUCTION

A recent focus of public concern with soil conservation is the conversion of native grassland for crop production popularly known as "sodbusting." Political reaction to this concern centers on bills introduced in the Congress (S. 663, Armstrong bill and H.R. 3457, Jones bill 99th Cong., 2nd Session (1984)) denying eligibility for Federal farm program benefits to farm operators who carry out such land use conversion on "fragile" or "highly erodible" land. Focus of this concern is the arid Western Great Plains.

Little is known about the occurrence and extent of such conversion (2,7).[1/] Even less is known about the characteristics and motivations of operators converting land. Huszar and Young interviewed a sample of 74 Colorado operators who operated land that had been converted recently (6). While a valuable effort, this study suffers from a small sample size and does not put characteristics of converters into perspective alongside operators who returned cropland to grazing use and owners who did not convert land.

This report analyzes a more comprehensive data base which sheds some light on the ownership characteristics of operators who converted land to cropland relative to all landowners in the area. In conjunction with physical data collected at the site, this data set gives some insights concerning the "sodbusting" phenomenon.

The 1978 Land Ownership Survey (LOS), conducted by Economic Research Service in conjunction with the 1977 National Resource Inventory, ascertained whether owners converted any land to cropland during the 1975-77 period that had not been recently cropped. Owners were also asked if they had ceased to use any land for crops that was used as cropland in 1974. This information was analyzed for the Nation by Daugherty (3). This report analyzes LOS and related data for additions to and removals from cropland in the Western Great Plains.

DEFINITIONS AND LIMITATIONS

This study defines the Western Great Plains (WGP) as Colorado, Montana, Nebraska, New Mexico, North and South Dakota, and Wyoming (see fig. 1). This definition is physiographically imprecise because it includes more humid portions of Nebraska and the Dakotas, and more mountainous areas of Colorado, New Mexico, Wyoming, and Montana. It also excludes relevant portions of Texas, Oklahoma, and Kansas. A better definition from the physiographic viewpoint might be Land Resource Region G,

1/ Underscored numbers in parentheses cite sources listed in the References.

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the Western Plains Range and Irrigated Region, outlined on figure 1 (10). However, because of the low sampling density in the LOS, ease of using Census of Agriculture and Statistical Reporting Service data, and greater policy relevance of State data, the seven-State definition was used.

The LOS contains information on owners of all land. In order to limit consideration to the relevant portion of the landowner population, owners who indicated that they did not own land in farms and ranches in the county were dropped from the data set. Thus, the data pertain only to farm and ranch landowners, even though individuals who may have converted some of the land now being operated as cropland may be excluded.

The following two questions are excerpted directly from the LOS questionnaire:

14. Of the land you own in the county did you CONVERT any LAND to CROPLAND during 1975-76-77 that had not been recently cropped?

____ yes ____ no

16. Were there any changes during 1975-76-77 in the LAND MANAGEMENT PRACTICES on land you own in this county?

B. Stop using any land for crops that was used for crops in 1974?

____ yes ____ no

Owners who responded "yes" to question 14 and "no" to question 16B were considered to have only added cropland to their holdings during this period, while the opposite response indicated only that land was removed from production. A "yes" response to both indicated that some land was added and some removed, but not necessarily the same land. Respondents answering "no" to both questions were considered to have performed no land conversion.

By merging the 1978 LOS data with the 1977 National Resource Inventory (NRI) data points on which the LOS sample was drawn, we can see an association between the landowner and physical characteristics of some of the land owned. While examination of the physical and management attributes of this land can yield some inferences about the operator's land and management in general, it cannot reveal detailed characteristics of the land added to or removed from production.

A total of 4,357 farm and ranch landowners were sampled in the seven WGP States; 938 of them converted some land in the 1975-77 period. A further 225 could not be classified as to conversion because they did not respond to either question 14 or 16B or both. Of the 4,058 LOS respondents nationwide who indicated that they had added cropland to their holdings (3), 747 or 18 percent were located in these seven States. In the remainder of this report, the results are expanded to the number of owners represented by the sample.

This relatively small sample size, compared with the entire LOS sample, means that small percentage differences in characteristics reported here are subject to sample variation. While it is impractical to calculate measures of variation for each item reported, the reader is cautioned to treat small differences reported in the tables with care.

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Figure 1--Western Great Plains States and Land Resource Region G.

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NUMBERS AND LOCATIONS

In 1977, there were almost 242,000 farm and ranch landowners in the seven WGP States or 3.5 percent of the national total. Of the 231,000 farm and ranch landowners who could be classified as to conversion activity, 40,639 added cropland to their holdings between 1974 and 1978. This is 6.7 percent of the total adding cropland in the United States in this period, a more than proportional response from the Western Great Plains.

About 15 percent of farm and ranch landowners added cropland, while 4.5 percent removed cropland from production and 2.5 percent both added and removed land (table 1). The majority (78 percent) converted no land during this period.

Table 1--Cropland conversion activity by farm and ranch landowners, Western Great Plains, 1974-1977

State	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Colorado	3,008	9.3	2,218	6.8	439	1.4	26,776	82.5	32,441	100.0
Montana	9,364	18.9	2,747	5.5	1,975	4.0	35,555	71.6	49,641	100.0
Nebraska	4,905	14.1	1,263	3.6	343	1.0	28,220	81.3	34,731	100.0
New Mexico	952	3.8	304	1.2	0	0	23,997	95.0	25,253	100.0
N. Dakota	6,856	20.0	2,023	5.9	702	2.0	24,754	72.1	34,335	100.0
S. Dakota	6,362	19.6	1,231	3.8	886	2.6	24,068	74.0	32,547	100.0
Wyoming	3,383	15.5	719	3.3	1,464	6.7	16,219	74.5	21,785	100.0
Total	34,831	15.1	10,505	4.6	5,808	2.5	179,589	77.8	230,732	100.0

Source: 1978 LOS.

About one-fifth of owners in the Dakotas and Montana added cropland, but only 4 percent added cropland in New Mexico. More than a quarter of the landowners adding cropland were in Montana alone, and the Northern Plains accounted for almost two-thirds of owners adding cropland. Montana also accounts for more than one-third of landowners both adding and removing cropland.

The amount of land added or removed from the cropland base by these owners cannot be obtained from the LOS data since owners were asked about the amount of land owned in total, not acreage added or removed. Agricultural census data for the period 1974 to 1978, presented in table 2, show that cropland in these seven States expanded by almost 800,000 acres (8 percent). All of the States, except the Dakotas, gained cropland. While no adequate data are available to show the amount of land converted, the LOS data allow examination of the characteristics of operations and owners converting land in this period.

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Table 2--Changes in cropland, Western Great Plains

State	Cropland		
	1974	1978	Change
	1,000 acres		
Colorado	10,513	10,703	190
Montana	15,446	16,326	880
Nebraska	22,213	22,399	186
New Mexico	2,187	2,304	117
N. Dakota	29,185	28,830	-355
S. Dakota	19,192	18 838	-354
Wyoming	2,644	2,760	116
Total	101,380	102,160	780

Source. U.S. Census of Agriculture, 1974, 1978.

CHARACTERISTICS OF THE OPERATIONS

Landowners who added cropland to their holdings between 1974 and 1977 had neither much larger nor much smaller operations than all farm and ranch landowners (table 3).

Table 3--Cropland conversion activity by farm and ranch landowners by size of operation, Western Great Plains, 1974-1977

Size of holding[1/]	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Less than 1/4 section[2/]	1,184	3.4	248	2.3	0	0	11,603	6.5	13,035	5.6
1/4 - 1 section	4,537	13.0	1,594	15.2	374	6.4	34,026	18.9	40,530	17.6
1-5 sections	14,636	42.0	4,357	41.5	1,727	29.7	57,653	32.1	78,373	34.0
5-20 sections	8,999	25.9	3,215	30.6	1,834	31.6	39,296	21.9	53,343	23.1
20 or more sections	5,475	15.7	1,090	10.4	1,874	32.3	37,011	20.6	45,451	19.7
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

1/ Includes all holdings in the United States.
2/ Based on 640 acres per section.

Source: 1978 LOS.

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The highest percentage of owners who added cropland held between one and five sections (1 section = 640 acres). Only 15 percent of adders held more than 20 sections. Owners who removed cropland from production have a similar size distribution, but have the smallest proportion of owners with holdings above 20 sections of the conversion classes. By contrast, owners who both added and removed cropland nad the fewest small holdings and the most large holdings. Almost a third of these owners had more than 20 sections.

Another measure of the size of farm operations is net farm income (table 4). Owners who had some conversion activity were more dependent on farm income than those who did not convert. Between 85 and 90 percent of owners who added or both added and removed cropland had farm income in 1977 compared with 82 percent who removed cropland and 77 percent who had no conversion. Owners who added cropland had a larger proportion with high (greater than $25,000) incomes and high losses (greater than $10,000 loss) than for all owners. This concentration of incomes in the high and low ends of the distribution is even more pronounced for owners who both added and

Table 4--Cropland conversion activity by farm and ranch landowners by net farm income, Western Great Plains, 1974-1977

Net farm income	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
No farm income	4,944	14.2	1,888	18.0	633	10.9	41,585	23.2	49,050	21.3
Greater than $10,000 loss	3,491	10.0	1,300	12.4	879	15.1	13,088	7.3	18,758	8.1
$0-$9,999 loss	3,706	10.6	1,110	10.6	421	7.3	18,805	10.5	24,042	10.4
$0-$9,999	9,845	28.3	3,270	31.0	1,151	19.8	52,290	29.0	66,556	28.8
$10-24,999	5,540	15.9	1,521	14.5	753	13.0	21,987	12.2	29,801	12.9
$25-49,999	2,115	6.1	302	2.9	29	.5	6,792	3.8	9,238	4.0
Greater than $50,000	1,885	5.4	43	.4	694	11.9	5,319	3.0	7,941	3.5
No response	3,304	9.5	1,071	10.2	1,248	21.5	19,723	11.0	25,346	11.0
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

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removed cropland. Owners who had both conversions also chose not to report farm income in the LOS almost twice as often as other owners. Owners who removed cropland from production had markedly fewer high farm incomes and a high percentage of high losses.

Ownership characteristics also serve to differentiate operations where land was converted. About 90 percent of the owners in these Western Great Plains States closely held their operations as sole proprietorships, family ownerships, and family partnerships or corporations. This breakdown holds for owners who added cropland and those who removed cropland. However, only about three-fourths of owners who both added and removed cropland had closely held ownerships. Almost a quarter of these owners were in nonfamily partnerships and corporations.

Owners who added cropland and those who removed land from production are more often full owner-operators than are owners generally (table 5). Owners who both added and removed cropland are less likely to be full owner-operators, but have the highest proportion of operator-landlords. However, owners of farm and ranch land involved in cropland conversion in this period were more often active farm operators than were owners who converted no land. Almost 25 percent of owners who converted no land between 1974 and 1977 were landlords.

Table 5--Cropland conversion activity by farm and ranch landowners by tenure, Western Great Plains, 1974-1977

Tenure class	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Owner-operator	26,208	75.2	8,473	80.6	3,268	56.3	120,091	66.9	158,040	68.5
Landlord	4,640	13.3	1,153	11.0	661	11.4	44,067	24.5	50,521	21.9
Operator-landlord	3,816	11.0	354	3.4	1,647	28.4	11,929	6.6	17,746	7.7
No response	166	.5	525	5.0	232	3.9	3,502	2.0	4,425	1.9
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

Two other variables available in the LOS give an idea of the dynamics of the farm operation. The period during which the largest portion of the owners' holdings were acquired indicates the age of operations engaged in conversion activity. Information on purchases and sales in the 1974 to 1977 period gives an indication as to whether the farm was expanding or contracting and if changes in cropland were from existing or new landholdings.

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More than a third of owners involved in conversion between 1974 and 1977 acquired most of their land during the 1970's (table 6). Only a little more than one quarter of those who converted no land acquired their land in this period. Owners who added cropland have relatively young operations, with the smallest percentage of acquisition before 1950. Removal of cropland occurs both in "young" operations that purchased land before 1970's and "old" operations that purchased land before 1940. Operations which both added and removed cropland had the highest percentage of recent acquisition, with more than a third of these owners acquiring their land since 1970 and almost 60 percent acquiring it since 1960.

Table 6--Cropland conversion activity by farm and ranch landowners by period of acquisition, Western Great Plains, 1974-1977

Period of acquisition[1/]	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1970-1978	12,126	34.8	3,395	32.3	2,064	35.5	49,112	27.4	66,697	28.9
1960-1969	7,766	22.3	2,411	23.0	1,322	22.8	45,120	25.1	56,619	24.5
1950-1959	6,914	19.9	1,184	11.3	541	9.3	31,156	17.3	39,795	17.3
1940-1949	3,936	11.3	1,204	11.4	825	14.2	25,172	14.0	31,137	13.5
Prior to 1940	4,088	11.7	2,311	22.0	1,056	18.2	29,029	16.2	36,484	15.8
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

1/ Acquisition of largest portion of total holdings in the county.

Only about a quarter of owners converting land to cropland bought land in the same period (table 7). More than a third of owners who both converted and removed cropland purchased land in the same period, and less than half of this group had no land transactions between 1974 and 1977. A larger proportion of owners who removed cropland from production sold land than in other classes.

A concern regarding operations converting land in the Western Great Plains is that they are controlled by "outsiders." This term can refer to non-U.S. citizens or to owners residing outside the county in which conversion occurs. Since the proportion of foreign owners in the entire population is low, area-based samples such as the LOS do not accurately represent them. Comprehensive data on foreign ownership is gathered under the Agricultural Foreign Investment Disclosure Act of 1978 (AFIDA). As of the end of 1983, only 811 parcels of land owned by non-U.S. citizens were

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Table 7--Cropland conversion activity by farm and ranch landowners by recent transactions, Western Great Plains, 1974-1977

Recent transactions[1/]	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Bought land	9,324	26.8	2,241	21.3	2,044	35.2	27,800	15.5	41,409	18.0
Sold land	2,680	7.7	1,290	12.3	453	7.8	11,293	6.3	15,716	6.8
Bought and sold	2,385	6.9	361	3.4	571	9.8	4,164	2.3	7,481	3.2
No transactions	20,441	58.6	6,613	63.0	2,740	47.2	136,332	75.9	166,126	72.0
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

1/ Purchases or sales of land in the county during 1975, 1976, or 1977.

reported in the Western Great Plains (8). Almost half of these were in Colorado. Foreigners owned 1.6 million acres of land in the Western Great Plains, about 20 percent of which was cropland. This is less than 1 percent of all cropland in the area, foreign owners are not likely to be responsible for a significant portion of land conversion.

More than 80 percent of owners who added or removed cropland resided in the same county as the land, a higher proportion than for owners who had no conversions (table 8). Owners who both added and removed cropland had the smallest proportion living in the same county as their land. About one-fifth of these owners lived in another State than that in which the converted land was located.

Distinctly different kinds of operations were involved in conversion activity. Most different from other farm and ranch operations are ones which both added and removed cropland. These operations were typically large (greater than five sections), often held in nonfamily ownerships, and were more often owned by an "outsider." The operation depended on farm income and appeared to be high-risk, garnering either high incomes or high losses. Owners were both operators and landlords, acquired their land recently, and bought more land at the same time they were converting land to cropland and removing some of their land from production.

Operations that have converted land to cropland are similar to the operations that both added and removed land but have some important differences. They are smaller (one to five sections), are 90-percent family owned, are operated by fullowners, and are owned by U.S. citizens residing in the same county as the land. Operations that have removed cropland from production are similar to those that added cropland, with

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Table 8--Cropland conversion activity by farm and ranch landowners by residence, Western Great Plains, 1974-1977

Residence[1/]	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Same county	29,958	86.0	8,802	83.8	4,174	71.9	133,264	74.2	176,198	76.4
Same State	3,417	9.8	817	7.8	480	8.3	24,580	13.7	29,294	12.7
Other United States	1,107	3.2	827	7.9	1,154	19.8	20,742	11.5	23,830	10.3
No response	348	1.0	59	.5	0	0	1,003	.6	1,410	.6
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

1/ In relationship to county and State where conversion occurred.

some exceptions. They are not as dependent on farm income and have a higher proportion with high farm income losses or low farm incomes. They either acquired their land recently, or prior to 1940. They have been both buyers and sellers of land between 1974 and 1977.

PERSONAL CHARACTERISTICS OF THE LANDOWNERS

In addition to characteristics relating to the farm operation, personal characteristics of the landowner may be associated with conversion activity or its absence. Such characteristics, for which data are available in the LOS, include age, education, occupation, and nonfarm income.

Age may play a role in the decision to convert land to cropland because of life cycle changes, as operators expand operations when young and cut back as they grow older. A higher proportion of owners who added cropland are young (less than 44 years old) than are owners in other conversion classes (table 9). Owners who removed cropland from production are also relatively young. Owners who both added and removed cropland have a similar age structure to those who had no conversion activity. Owners who added and removed cropland have more than twice as high a proportion in corporations or other "ageless" ownerships.

More educated owners may see opportunities for expanding cropland holdings where others may not. As shown in table 10, owners who added cropland have educational distributions similar to owners as a whole. Owners who removed cropland from production are less educated, with the lowest proportion of college graduates of any conversion class. Large percentages (20-25 percent) of owners who both added and removed cropland have either elementary school education or some college.

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Table 9--Cropland conversion activity by farm and ranch landowners by age, Western Great Plains, 1974-1977

Age	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Less than 25 years	261	0.8	0	0	0	0	961	0.5	1,222	0.5
25-34	2,305	6.6	1,011	9.6	472	8.1	6,988	3.9	10,776	4.7
35-44	6,430	18.5	1,194	11.4	625	10.8	18,712	10.4	26,961	11.7
45-54	8,497	24.4	2,709	25.8	959	16.5	40,979	22.8	53,144	23.0
55-64	8,422	24.2	2,145	20.4	1,228	21.2	39,174	21.8	50,969	22.1
65 and older	4,321	12.4	1,954	18.6	1,186	20.4	41,363	23.0	48,824	21.2
Corporations	3,304	9.5	1,071	10.2	1,248	21.5	19,723	11.0	25,346	11.0
No response	1,290	3.6	421	4.0	90	1.5	11,689	6.6	13,490	5.8
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

Table 10--Cropland conversion activity by farm and ranch landowners by education, Western Great Plains, 1974-1977

Education	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Elementary	5,682	16.3	2,276	21.7	1,391	24.0	31,137	17.3	40,486	17.6
High school	14,559	41.8	4,291	40.8	1,022	17.6	65,400	36.4	85,272	37.0
Some college	4,854	14.0	1,092	10.4	1,242	21.4	23,164	12.9	30,352	13.1
College graduate	4,948	14.2	900	8.6	713	12.2	23,684	13.2	30,245	13.1
No response or corporate	4,787	13.7	1,946	18.5	1,440	24.8	36,204	20.2	44,377	19.2
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

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Farmers are more likely to add cropland than are owners with other occupations. More than 60 percent of all owners in the Western Great Plains are farmers. Among owners who added cropland, 71 percent were farmers. Surprisingly, 68 percent of owners who removed cropland from production were farmers as well. The lowest percentages of farmers were found among owners who had no conversion activity (62 percent) and owners who both added and removed cropland (63 percent).

Between 8 and 10 percent of owners who had no conversion or who both added and removed cropland were retired, while only 5 percent of adders or removers were retired. White collar occupations were the next highest category (6-7 percent) among all conversion classes except removers. The highest proportion of blue collar occupations occurred among owners who removed cropland from production.

About 40 percent of farm and ranch landowners reported nonfarm income for 1977 (table 11). Owners who both added and removed cropland had both the highest nonfarm incomes and the largest percentage with nonfarm losses of any conversion class. Owners who removed cropland from production had the highest percentage reporting no farm income and the smallest percentage with high nonfarm incomes. Owners who had no conversion had the lowest proportion reporting no nonfarm income.

Table 11--Cropland conversion activity by farm and ranch landowners by nonfarm income, Western Great Plains, 1974-1977

Nonfarm income	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added or removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
No nonfarm income	13,483	38.7	4,191	39.9	1,959	33.7	52,969	29.5	72,602	31.5
Greater than $10,000 loss	152	.4	0	0	30	.5	406	.3	588	.3
$0-$9,999 loss	3,512	10.1	955	9.1	788	13.6	19,664	10.9	24,919	10.8
$0-$9,999	5,162	14.8	1,366	13.0	362	6.2	24,631	13.7	31,521	13.7
$10-$24,999	3,129	9.0	1,114	10.6	326	5.6	18,544	10.3	23,113	10.0
$25-$49,999	1,236	3.6	182	1.7	0	0	5,318	3.0	6,736	2.9
Greater than $50,000	685	2.0	108	1.0	789	13.6	4,492	2.5	6,074	2.6
No response	7,471	21.4	2,589	24.7	1,554	26.8	53,565	29.8	65,179	28.2
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

In summary, the personal characteristics of owners differ by conversion class. Again, the most distinctive group are owners who have both added and removed cropland from production. This group is more often a corporate ownership than other classes. Where individual characteristics are reported for this class, they are generally older, either high school dropouts or graduates with some college, and have higher nonfarm incomes and higher nonfarm losses than other classes, as well as substantial farm income. Owners who added cropland are generally younger, better educated, more likely to be farmers, and derive most of their income from farm sources.

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By contrast, owners who removed cropland from production are generally older, less educated, and have the least income from nonfarm sources. These owners are also most likely to be farmers, and least likely to have white collar or other occupations. Owners who converted no land during this period are the oldest, the least likely to be farmers, and rely on nonfarm income the most of any conversion class.

CHARACTERISTICS OF LAND AND MANAGEMENT

Since the 1978 LOS surveyed owners of land on which 1977 NRI sample points fell, there is a link between the physical characteristics at the point and the characteristics of the owner of that point. With regard to land conversion, however, that link is a tenuous one because we do not know if the NRI point falls on land that was converted or other owned land that was not converted. Despite this flaw, we can learn something of the general conservation management practiced by the owner by observing the treatment of the sampled point. It must be stressed, however, that what follows does not relate to the land actually converted to or from cropland.

Conservation management is a combination of matching land use to the physical features of the land and applying appropriate conservation measures to land in a particular use. A recently developed erosion classification separates inherent physical factors contributing to erosion, such as climate, soil, and slope, from management factors such as crop rotation, cover type and quality, and conservation practices (1,5). Land falls into three classes based on physical constraints on erosion: nonerodible, moderately erodible, and highly erodible. The nonerodible class will not erode above a tolerable soil loss goal of 5 tons per acre per year (TAY) under any conceivable management, while the highly erodible class will always erode above the goal if it is used in crop production. Land in the moderately erodible group will erode above tolerance if poor cultural and conservation practices are used, but can meet the soil loss goal if appropriate management is employed.

The number of owners with sampled farm and ranch land in the four erosion classes described above is shown in table 12. There is little evidence that owners who have converted land use any more erosive management than those who had no conversion activity. In fact, the highest proportion of highly erodible and erosively managed cropland is owned by those who converted no land in this period. The highest proportions of nonerodible land are owned by those who added or added and removed cropland from production. The lowest proportion of highly erodible land is owned by these latter owners.

There is an additional qualification in this analysis for the Western Great Plains. The classification used above pertains to erosion from sheet and rill processes caused by rainfall. In the arid Great Plains, much erosion is generated by wind rather than water. While no analogous classification for wind erosion could be constructed with the data available in the 1977 NRI, both wind and water erosion rates are available. Adding the wind and water erosion rates into a combined erosion rate and dividing this by the tolerable erosion rate for each sample point yields the information displayed in table 13.

The vast proportion of owners in all conversion classes have combined wind and water erosion rates below the tolerance values for the soils at the points sampled. Tolerance (T) values are the maximum rates of soil erosion consistent with indefinite maintenance of soil productivity. They range from 2 to 5 TAY. Rather

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Table 12--Erosion class of sampled land owned by farm and ranch landowners by conversion class, Western Great Plains, 1977

Erosion class	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Nonerosive	17,670	50.7	5,063	48.2	2,875	49.5	85,597	47.7	111,205	48.2
Moderately erosive Managed:										
Below TAY[1/]	14,515	41.7	4,777	45.5	2,745	47.3	75,870	42.2	97,907	42.4
Above TAY[1/]	1,072	3.1	251	2.4	139	2.4	8,271	4.6	9,733	4.2
Highly erosive	1,573	4.5	414	3.9	49	.8	9,851	5.5	11,887	5.2
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

1/ TAY is tons per acre per year.

Table 13--Combined erosion rate by tolerance class of sampled land owned by farm and ranch landowners, Western Great Plains, 1977

Combined erosion rate of--	Number and percentage of owners who--									
	Added cropland		Removed cropland		Added and removed cropland		Did not add or remove cropland		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Less than T value[1/]	30,793	88.4	9,398	89.5	4,876	84.0	151,956	84.6	197,023	85.4
1-2 times T value[T/]	2,542	7.3	548	5.2	883	15.2	13,162	7.3	17,135	7.4
2-3 times T value[T/]	579	1.7	83	.8	29	.5	4,430	2.5	5,121	2.2
Greater than 3 times T[1/]	916	2.6	476	4.5	20	.3	10,041	5.6	11,453	5.0
Total	34,830	100.0	10,505	100.0	5,808	100.0	179,589	100.0	230,732	100.0

1/ T value is the tolerable soil loss level. At erosion rates below T, land may be cropped indefinitely without loss of productivity.

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than high erosion on recently converted land, the evidence suggests that higher erosion occurs on land owned by those who have not engaged in land conversion recently. The exception is with owners who have both added and removed cropland where 15 percent of such owners have combined erosion rates as high as twice the tolerable level. A relatively high proportion of owners who removed cropland from production have erosion rates in excess of three times T value on their land. These findings are consistent with those of Gertel, Lewis, and Miranda regarding conservation investment by nonoperator owners and retired owners (4).

One management option that can mitigate wind erosion in the Western Great Plains is irrigation. Supplementing the natural moisture on arid lands in this region increases the vegetative cover and keeps the land from blowing (9). About a third of the owners practiced irrigation during the 1975 to 1977 period, according to the LOS. More than 40 percent of owners who added cropland practiced irrigation. Among owners who converted no land, only 30 percent irrigated.

While the link to physical characteristics of the land in this data set is not perfect, the evidence does not support the hypothesis that owners who convert land to cropland farm more erosive land or farm their land more erosively. On the contrary, owners who did not convert any land during the 1975 to 1977 period have a higher proportion of highly erodible and erosively managed cropland than other owners and have higher combined erosion rates. Fewer owners in this class mitigate potential wind erosion through irrigation than do owners who added cropland.

CONCLUSIONS AND IMPLICATIONS

This study examined a comprehensive sample of farm and ranch landowners in the seven Western Great Plains States, classified by land conversion activity in the period 1975 to 1977. What kind of composite profiles emerge for owners in each erosion class? What are the implications for conservation policy with regard to conversion of native grassland?

The differences between owners who converted land and those who did not are matters of degree, rather than sharp, qualitative distinctions. Examples of all levels of a characteristic can be found in each conversion class. Nevertheless, certain generalizations can be drawn regarding owners who converted cropland during this period.

First, operations that added cropland displayed attributes of an expanding growth stage in the firm's life cycle. More of these operations were in the middle size range of one to five sections than other classes. More of the operations had farm income, and more incomes were very high or were large farm losses. This is consistent with more risky operations than normal, or with heavily invested, growing operations that have not begun to pay out. Full owner-operation is the rule for these ownerships, and relatively few are landlords. More of these owners acquired the bulk of their land recently than those who did not convert land, and more have been active sellers and/or buyers of land during the period. More of these operations are locally owned than those who converted no land. Owners of these operations are younger, more likely to list their occupation as "farmer," and have no nonfarm income or lower nonfarm incomes than those who did not convert land.

Owners who removed cropland from production share many of these characteristics, but have some special qualities. They are less educated and list occupations of "farmer" or "blue-collar." More of them have sold land recently than other classes

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and they acquired the bulk of their holdings either recently or prior to 1940. Many have high farm losses but relatively few have high farm or nonfarm incomes. Many are younger than 35 years of age or older than 65 years. It is likely that two sub-groups are combined here: young farmers who are failing or retrenching, and older farmers who are leaving farming.

The third group is most distinctive. Owners who both added and removed cropland from production have many characteristics of speculators or speculator operators. They have larger operations; a third of them own more than 20 sections. They have the highest percentage of high farm and nonfarm incomes and the highest proportion of farm and nonfarm losses. Almost all of them have some farm income, but only 60 percent list their occupation as "farmer." Relatively few are full owner-operators, but they have the highest proportion of operator-landlords. This class has the lowest proportion of local residence and the highest proportion of out-of-State residence. This class had the highest proportion of recent land acquisition, although a substantial percentage purchased their holdings prior to 1950. They have been the most active in recent purchases and sales of land.

There is little evidence that owners who converted land to cropland in the Western Great Plains during this period contributed to erosion problems to any greater extent than those who converted no land. The possible exception is the 15 percent of operators who both added and removed cropland that had land eroding with a combined rate of up to twice T values. In fact, higher proportions of owners who converted land farmed nonerodible land, had combined erosion rates below T value, and used erosion-mitigating irrigation than did nonconverters.

Implications of these findings for soil conservation policy are several. First, the kinds of operations most likely to be involved in converting land have some distinctive characteristics which may serve to differentiate them from farms generally. Conversion of land to cropland is likely to be done by relatively new, expanding operations of medium size that are largely owned and operated by full-time local farmers and by more established speculative operations that are larger, and owned by part-owner landlords, many of whom are not local residents. This latter group is probably buying, developing, and reselling land. Second, good prospects for educational efforts to convert cropland back to noncrop uses will probably also be relatively new operations, or farmers nearing retirement who have probably been relatively unsuccessful in recent years. Third, conversion activity by itself may be a poor guide to potential erosion problems since owners who converted land appear to practice conservation at least as much as those who did not convert land. Concentration on speculative operations and on the erosiveness of the specific land converted may be preferable to general concern over "sodbusting" activity.

REFERENCES

1. Bills, N.L. and R.E. Heimlich. Assessing Erosion on U.S. Cropland: Land Management and Physical Features. AER-513, Econ. Res. Serv., U.S. Dept. Agr. July 1984.

2. Boxley, R.F. "The Economics of Sodbusting," unpublished. Econ. Res. Serv., U.S. Dept. Agr., 1984.

3. Daugherty, A.B. "Characteristics of Landowners Making Additions to Cropland." Staff Report AGES840506, Econ. Res. Serv., U.S. Dept. Agr. July 1984.

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4. Gertel, K., D.G. Lewis, and K.M. Miranda. "Investment in Land by Landowner Classes." Staff Report AGES841029. Econ. Res. Serv., U.S. Dept. Agr. Feb. 1985.

5. Heimlich, R.E. and N.L. Bills. "An Improved Soil Erosion Classification for Conservation Policy." JSWC 39(4):261-266, 1984.

6. Huszar, P.C. and J.E. Young. "Why the Great Colorado Plowout?" JSWC 39(4):232-235, 1984.

7. Jagger, C. "The Conversion of Marginal Land to Cropland on the Great Plains," unpublished. Dept. Agr. Econ., Cornell Univ., 1984.

8. Majchrowicz, T.A. and J.P. DeBraal. "Foreign Ownership of U.S. Agricultural Land Through December 31, 1983--County Level Data." Staff Report No. AGES840502. Econ. Res. Serv., U.S. Dept. Agr. May 1984 (Rev. June 1984).

9. Skidmore, E.L. 1983. "Wind Erosion Calculator: Revision of Residue Table." JSWC 38(2):110-113.

10. U.S. Dept. of Agriculture, Soil Conservation Service. Land Resource Regions and Major Land Resource Areas of the United States. AHB-296. 1978

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